Claims

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1. A composition comprising a synergistically effective active compound combination of compounds of the nicotinergic acetylcholine receptor agonists and antagonists of the formula (I)

$$\begin{array}{c}
R-N \\
\downarrow I \\
X-E
\end{array}$$
(I)

in which

R represents hydrogen, optionally substituted radicals acyl, alkyl, aryl, aralkyl, heterocyclyl, heteroaryl or heteroarylalkyl;

A represents a monofunctional group from the group consisting of hydrogen, acyl, alkyl, aryl or represents a bifunctional group attached to the radical Z;

E represents an electron-withdrawing radical;

X represents the radicals -CH= or =N-, where the radical -CH= may be attached to the radical Z' instead of an H atom;

15 Z represents a monofunctional group from the group consisting of alkyl, -OR, -SR, -N(R)₂,

where the radicals R are identical or different and are as defined above, or represents a bifunctional group attached to the radical A or the radical X,

and at least one active compound from the group of the anthranilamides of the formula (II)

2. The composition as claimed in claim 1, comprising at least one of the following compounds of the formula (I)

$$CI \longrightarrow CH_2 - N \longrightarrow NH$$

$$NO_2$$

$$CI \longrightarrow CH_2 - N \longrightarrow NH_2$$

$$N \longrightarrow NO_2$$

$$CH_3 \longrightarrow NH_2$$

$$N \longrightarrow NO_2$$

$$CH_3 \longrightarrow NH_2$$

$$N \longrightarrow NH_$$

$$CI \longrightarrow CH_2 - N \longrightarrow N \longrightarrow CN$$

$$CI \longrightarrow CH_2 - N \longrightarrow NH$$

$$N - NO_2$$

$$CI \longrightarrow CH_2 - N \longrightarrow NH$$

$$N - NO_2$$

$$CI \longrightarrow CH_2 - N \longrightarrow NH$$

$$CN \longrightarrow CH_2 - N \longrightarrow NH$$

$$CH \longrightarrow CH_2 - N \longrightarrow NH$$

$$CH \longrightarrow CH_2 - N \longrightarrow NH$$

$$CH \longrightarrow NO_2$$

$$CI \longrightarrow CH_2 - N \longrightarrow NH$$

$$CH \longrightarrow CH_2 - N \longrightarrow NH$$

$$CH \longrightarrow NO_2$$

$$CH_3 \longrightarrow CH_2 - N \longrightarrow N(CH_3)_2$$

$$CH \longrightarrow NO_2$$

$$CH_3 \longrightarrow N(CH_3)_2$$

$$CH_3 \longrightarrow N(CH_3)_2$$

$$CH_3 \longrightarrow NO_2$$

$$CH_3 \longrightarrow N(CH_3)_2$$

$$CH_3 \longrightarrow NO_2$$

3. The composition as claimed in claim 1 or 2, comprising at least one active compound from the group of the anthranilamides of the formula (II)

in which

A¹ and A² independently of one another represent oxygen or sulfur,

X¹ represents N or CR¹⁰,

R¹ represents hydrogen or represents in each case optionally mono- or polysubstituted C_1 - C_6 -alkyl, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl or C_3 - C_6 -cycloalkyl, where the substituents independently of one another may be selected from the group consisting of R⁶, halogen, cyano, nitro, hydroxyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylsulfinyl, C_1 - C_4 -alkylsulfonyl, C_2 - C_4 -alkoxycarbonyl, C_1 - C_4 -alkylamino, C_2 - C_8 -dialkylamino, C_3 - C_6 -cycloalkylamino, $(C_1$ - C_4 -alkyl) C_3 - C_6 -cycloalkylamino and R¹¹,

R² represents hydrogen, C_1 - C_6 -alkyl, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylamino, C_2 - C_8 -dialkylamino, C_3 - C_6 -cycloalkylamino, C_2 - C_6 -alkoxycarbonyl or C_2 - C_6 -alkylcarbonyl,

represents hydrogen, R¹¹ or represents in each case optionally mono- or polysubstituted C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, where the substituents independently of one another may be selected from the group consisting of R⁶, halogen, cyano, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfonyl, C₂-C₆-alkoxycarbonyl, C₂-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl, R¹¹, phenyl, phenoxy and a 5- or 6-membered heteroaromatic ring, where each phenyl, phenoxy and 5- or 6-membered heteroaromatic ring may optionally be substituted and where the substituents independently of one another may be selected from one to three radicals W or one or more radicals R¹², or

R² and R³ may be attached to one another and form the ring M,

represents hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkyl-

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sulfinyl, C₁-C₄-haloalkylsulfonyl, C₁-C₄-alkylamino, C₂-C₈-dialkylamino, C₃-C₆-cycloalkylamino, C₃-C₆-trialkylsilyl or represents in each case optionally mono- or polysubstituted phenyl, benzyl or phenoxy, where the substituents independently of one another may be selected from the group consisting of C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₄-alkynyl, C₃-C₆-cycloalkyl, C₁-C₄-haloalkyl, C₂-C₄-haloalkenyl, C₂-C₄-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, nitro, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfonyl, C₁-C₄-alkylamino, C₂-C₈-dialkylamino, C₃-C₆-cycloalkylamino, C₃-C₆-(alkyl)-cycloalkylamino, C₂-C₈-dialkylaminocarbonyl, C₂-C₆-alkoxycarbonyl, C₂-C₆-alkylaminocarbonyl, C₃-C₈-dialkylaminocarbonyl and C₃-C₆-trialkylsilyl,

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R⁵ and R⁸ in each case independently of one another represent hydrogen, halogen or represent in each case optionally substituted C₁-C₄-alkyl, C₁-C₄-haloalkyl, R¹², G, J, -OJ, -OG, -S(O)_p-J, -S(O)_p-G, -S(O)_p-phenyl, where the substituents independently of one another may be selected from one to three radicals W or from the group consisting of R¹², C₁-C₁₀-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₄-alkoxy and C₁-C₄-alkythio, where each substituent may be substituted by one or more substituents independently of one another selected from the group consisting of G, J, R⁶, halogen, cyano, nitro, amino, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfonyl, C₁-C₄-alkylamino, C₂-C₈-dialkylamino, C₃-C₆-trialkylsilyl, phenyl and phenoxy, where each phenyl or phenoxy ring may optionally be substituted and where the substituents independently of one another may be selected from one to three radicals W or one or more radicals R¹²,

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in each case independently of one another represent a 5- or 6-membered nonaromatic carbocyclic or heterocyclic ring which optionally contains one or two ring members from the group consisting of C(=O), SO and S(=O)₂ and which may optionally be substituted by one to four substituents independently of one another selected from the group consisting of C₁-C₂-alkyl, halogen, cyano, nitro and C₁-C₂-alkoxy, or independently of one another represent C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₇-cycloalkyl, (cyano)C₃-C₇-cycloalkyl, (C₁-C₄-alkyl)C₃-C₆-cycloalkyl, (C₃-C₆-cycloalkyl) and (cycloalkyl)-alkyl may optionally be substituted by one or more halogen atoms,

in each case independently of one another represent an optionally substituted 5- or 6-membered heteroaromatic ring, where the substituents independently of one another may be selected from one to three radicals W or one or more radicals R¹²,

| | R^6 | independently of one another represent $-C(=E^1)R^{19}$, $-LC(=E^1)R^{19}$, $-C(=E^1)LR^{19}$, |
|----|-------------------|--|
| | | $-LC(=E^{1})LR^{19}$, $-OP(=Q)(OR^{19})_{2}$, $-SO_{2}LR^{18}$ or $-LSO_{2}LR^{19}$, where each E^{1} |
| | | independently of the others represents O, S, N-R ¹⁵ , N-OR ¹⁵ , N-N(R ¹⁵) ₂ , N-S=O, |
| | | N-CN or N-NO ₂ , |
| 5 | R^7 | represents hydrogen, C ₁ -C ₄ -alkyl, C ₁ -C ₄ -haloalkyl, halogen, C ₁ -C ₄ -alkoxy, C ₁ -C ₄ - |
| | | haloalkoxy, C ₁ -C ₄ -alkylthio, C ₁ -C ₄ -alkylsulfinyl, C ₁ -C ₄ -alkylsulfonyl, C ₁ -C ₄ -halo- |
| | | alkylthio, C ₁ -C ₄ -haloalkylsulfinyl, C ₁ -C ₄ -haloalkylsulfonyl, |
| | R^9 | represents C ₁ -C ₄ -haloalkyl, C ₁ -C ₄ -haloalkoxy, C ₁ -C ₄ -haloalkylsulfinyl or halogen, |
| | R^{10} | represents hydrogen, C ₁ -C ₄ -alkyl, C ₁ -C ₄ -haloalkyl, halogen, cyano or C ₁ -C ₄ -halo- |
| 10 | | alkoxy, |
| | \mathbb{R}^{11} | in each case independently of one another represent in each case optionally mono- |
| | | to trisubstituted C ₁ -C ₆ -alkylthio, C ₁ -C ₆ -alkylsulfenyl, C ₁ -C ₆ -haloalkythio, C ₁ -C ₆ - |
| • | | haloalkylsulfenyl, phenylthio or phenylsulfenyl, where the substituents |
| | | independently of one another may be selected from the list consisting of W, |
| 15 | | $-S(O)_nN(R^{16})_2$, $-C(=O)R^{13}$, $-L(C=O)R^{14}$, $-S(C=O)LR^{14}$, $-C(=O)LR^{13}$, |
| | | $-S(O)_nNR^{13}C(=O)R^{13}$, $-S(O)_nNR^{13}C(=O)LR^{14}$ and $-S(O)_nNR^{13}S(O)_2LR^{14}$, |
| | L | in each case independently of one another represent O, NR ¹⁸ or S, |
| | R^{12} | in each case independently of one another represent -B(OR ¹⁷) ₂ , amino, SH, thio- |
| | | cyanato, C ₃ -C ₈ -trialkylsilyloxy, C ₁ -C ₄ -alkyl disulfide, -SF ₅ , -C(=E ¹)R ¹⁹ , |
| 20 | | $-LC(=E^{1})R^{19}$, $-C(=E^{1})LR^{19}$, $-LC(=E^{1})LR^{19}$, $-OP(=Q)(OR^{19})_{2}$, $-SO_{2}LR^{19}$ or |
| | | -LSO ₂ LR ¹⁹ , |
| | Q | represents O or S, |
| | R^{13} | in each case independently of one another represent hydrogen or represent in each |
| | | case optionally mono- or polysubstituted C ₁ -C ₆ -alkyl, C ₂ -C ₆ -alkenyl, C ₂ -C ₆ -alkynyl |
| 25 | | or C ₃ -C ₆ -cycloalkyl, where the substituents independently of one another may be |
| | | selected from the group consisting of R ⁶ , halogen, cyano, nitro, hydroxyl, C ₁ -C ₄ - |
| | • | alkoxy, C ₁ -C ₄ -alkylsulfinyl, C ₁ -C ₄ -alkylsulfonyl, C ₁ -C ₄ -alkylamino, C ₂ -C ₈ -dialkyl- |
| | | amino, C ₃ -C ₆ -cycloalkylamino and (C ₁ -C ₄ -alkyl)C ₃ -C ₆ -cycloalkylamino, |
| | R^{14} | in each case independently of one another represent in each case mono- or |
| 30 | | polysubstituted C ₁ -C ₂₀ -alkyl, C ₂ -C ₂₀ -alkenyl, C ₂ -C ₂₀ -alkynyl or C ₃ -C ₆ -cycloalkyl, |
| | · . | where the substituents independently of one another may be selected from the |
| | | group consisting of R ⁶ , halogen, cyano, nitro, hydroxyl, C ₁ -C ₄ -alkoxy, C ₁ -C ₄ - |
| | | alkylsulfinyl, C ₁ -C ₄ -alkylsulfonyl, C ₁ -C ₄ -alkylamino, C ₂ -C ₈ -dialkylamino, C ₃ -C ₆ - |
| | | cycloalkylamino and (C ₁ -C ₄ -alkyl)C ₃ -C ₆ -cycloalkylamino or represent optionally |
| 35 | | substituted phenyl, where the substituents independently of one another may be |
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selected from one to three radicals W or one or more radicals R^{12} ,

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- in each case independently of one another represent hydrogen or represent in each case mono- or polysubstituted C₁-C₆-haloalkyl or C₁-C₆-alkyl, where the substituents independently of one another may be selected from the group consisting of cyano, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfonyl, C₁-C₄-alkylamino, C₂-C₈-dialkylamino, C₂-C₆-alkoxycarbonyl, C₂-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl and optionally substituted phenyl, where the substituents independently of one another may be selected from one to three radicals W or one or more radicals R¹², or N(R¹⁵)₂ represents a cycle which forms the ring M,
- R^{16} represents C_1 - C_{12} -alkyl or C_1 - C_{12} -haloalkyl, or $N(R^{16})_2$ represents a cycle which forms the ring M,
- R¹⁷ in each case independently of one another represent hydrogen or C₁-C₄-alkyl, or B(OR¹⁷)₂ represents a ring, where the two oxygen atoms are attached via a chain to two or three carbon atoms which are optionally substituted by one or two substituents independently of one another selected from the group consisting of methyl and C₂-C₆-alkoxycarbonyl,
- R^{18} in each case independently of one another represent hydrogen, C_1 - C_6 -alkyl or C_1 - C_6 -haloalkyl, or $N(R^{13})(R^{18})$ represents a cycle which forms the ring M,
- R¹⁹ in each case independently of one another represent hydrogen or represent in each case optionally mono- or polysubstituted C₁-C₆-alkyl, where the substituents independently of one another may be selected from the group consisting of cyano, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulfinyl, C₁-C₄-alkylsulfinyl, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfonyl, C₁-C₄-alkylamino, C₂-C₈-dialkylamino, CO₂H, C₂-C₆-alkoxy-carbonyl, C₂-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl and optionally substituted phenyl, where the substituents independently of one another may be selected from one to three radicals W, C₁-C₆-haloalkyl, C₃-C₆-cycloalkyl or phenyl or pyridyl, each of which is optionally mono- to trisubstituted by W,
- M in each case represents an optionally mono- to tetrasubstituted ring which, in addition to the nitrogen atom which is attached to the substituent pair R¹³ and R¹⁸, (R¹⁵)₂ or (R¹⁶)₂, contains two to six carbon atoms and optionally additionally a further nitrogen, sulfur or oxygen atom, and where the substituents independently of one another may be selected from the group consisting of C₁-C₂-alkyl, halogen, cyano, nitro and C₁-C₂-alkoxy,
 - W in each case independently of one another represent C₁-C₄-alkyl, C₂-C₄-alkenyl,

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 C_2 - C_4 -alkynyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -haloalkyl, C_2 - C_4 -haloalkenyl, C_2 - C_4 -haloalkynyl, C_3 - C_6 -halocycloalkyl, halogen, cyano, nitro, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulfinyl, C_1 - C_4 -alkylsulfonyl, C_1 - C_4 -alkylamino, C_2 - C_8 -dialkylamino, C_3 - C_6 -cycloalkylamino, C_2 - C_4 -alkylcarbonyl, C_2 - C_6 -alkoxycarbonyl, C_2 - C_6 -alkylaminocarbonyl, C_3 - C_8 -dialkylaminocarbonyl or C_3 - C_6 -trialkylsilyl,

- n in each case independently of one another represent 0 or 1,
- p in each case independently of one another represent 0, 1 or 2.

where in the case that (a) R⁵ represents hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkynyl, C₁-C₄-haloalkoxy, C₁-C₄-haloalkylthio or halogen and (b) R⁸ represents hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₁-C₄-haloalkoxy, C₁-C₄-haloalkylthio, halogen, C₂-C₄-alkylcarbonyl, C₂-C₆-alkylaminocarbonyl or C₃-C₈ dialkylaminocarbonyl, (c) at least one substituent selected from the group consisting of R⁶, R¹¹ and R¹² is present and (d), if R¹² is not present, at least one R⁶ or R¹¹ is different from C₂-C₆-alkylcarbonyl, C₂-C₆ alkoxycarbonyl, C₂-C₆-alkylaminocarbonyl and C₃-C₈-dialkylaminocarbonyl.

4. The composition as claimed in claim 1, 2 or 3, comprising at least one active compound from the group of the anthranilamides of the formula (II-1)

$$R^3$$
 R^2
 R^5
 R^4
 R^4
 R^7
 R^7
 R^7
 R^9

in which

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R² represents hydrogen or C₁-C₆-alkyl,

R³ represents C₁-C₆-alkyl which is optionally substituted by a radical R⁶,

R⁴ represents C₁-C₄-alkyl, C₁-C₂-haloalkyl, C₁-C₂-haloalkoxy or halogen,

R⁵ represents hydrogen, C₁-C₄-alkyl, C₁-C₂-haloalkyl, C₁-C₂-haloalkoxy or halogen,

R⁶ represents -C(=E²)R¹⁹, -LC(=E²)R¹⁹, -C(=E²)LR¹⁹ or -LC(=E²)LR¹⁹, where each E² independently of the others represents O, S, N-R¹⁵, N-OR¹⁵, N-N(R¹⁵)₂, and each L independently of the others represents O or NR¹⁸,

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| | R ⁷ | represents C ₁ -C ₄ -haloalkyl or halogen, |
|---|-----------------|--|
| | R ⁹ | represents C ₁ -C ₂ -haloalkyl, C ₁ -C ₂ -haloalkoxy, S(O) _p C ₁ -C ₂ -haloalkyl or halogen, |
| | R ¹⁵ | in each case independently of one another represent hydrogen or represent in each |
| | | case optionally substituted C ₁ -C ₆ -haloalkyl or C ₁ -C ₆ -alkyl, where the substituents |
| 5 | | independently of one another may be selected from the group consisting of cyano, |
| | | $C_1\text{-}C_4\text{-}alkoxy,\ C_1\text{-}C_4\text{-}haloalkoxy,\ C_1\text{-}C_4\text{-}alkylthio,\ C_1\text{-}C_4\text{-}alkylsulfinyl,\ C_1\text{-}C_4\text{-}alky$ |
| | | sulfonyl, C ₁ -C ₄ -haloalkylthio, C ₁ -C ₄ -haloalkylsulfinyl or C ₁ -C ₄ -haloalkylsulfonyl, |
| | R ¹⁸ | in each case represents hydrogen or C ₁ -C ₄ -alkyl, |
| | R ¹⁹ | in each case independently of one another represent hydrogen or C ₁ -C ₆ -alkyl, |

independently of one another represents 0, 1, 2.

5. The composition as claimed in claimed in claim 1, 2, 3 or 4, comprising the agonist or antagonist of nicotinergic acetylcholine receptors of the formula (I) and an anthranilamide of the formula (II) in a ratio of from 250:1 to 1:50.

6. The use of a synergistically effective mixture comprising compounds of the formula (I) as set forth in claim 1 or 2 and at least one anthranilamide of the formula (II) for controlling animal pests.

7. A process for preparing pesticides, characterized in that a synergistically effective mixture comprising compounds of the formula (I) as set forth in claim 1 or 2 and at least one anthranilamide of the formula (II) are mixed with extenders and/or surfactants.